REMARKS

Even though this response has some length to it applicants believe the suggestions from the office action resolve the issues in this case. Reconsideration of this application is respectfully requested. Claims 33, 34, and 37-46 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over prior art of record US 2002/0138687 Al by Yang et al. ("Yang") in view of U.S. Patent No. 6,105,094 to Lindeman ("Lindeman") and prior art of record "Service Disciplines for Guaranteed Performance Service in Packet-Switching Networks" by Zhang ("Zhang"). Claims 35-36 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Yang, Lindeman and Zhang and further in view of prior art of record U.S. Patent Application Publication US 2002/0129173 Al by Weber ("Weber '02"). Claims 47-50 and 53-55 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 5,440,752 to Lentz et al. ("Lentz") in view of U.S. Patent 4,393,470 to Miard ("Miard"). Claims 51 and 52 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Lentz and Miard in view of U.S. Patent Application Publication 2002/0038397 A1 by Singh et al. ("Singh"). Claims 56-58 and 60 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Lentz and Miard in view Weber '02. Claim 59 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Lentz, Miard, and Weber '02 in view of Singh. Claim 61 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Lentz, Miard, and Weber '02 in view of Yang. Claims 33-34, 37-39, and 47-56 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claims 33-39 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant

regards as the invention. Claim 62 stands objected to as a dependent claim but allowable if re-written as an independent claim.

Claims 33, 47, and 57 have been amended. Claims 60-62 have been canceled.

The office action states "Claim 62 stands objected to as a dependent claim but allowable if re-written as an independent claim." Amended independent claim 57 incorporates the limitations of objected to claim 62 including the limitations in former claims 61 and 60. Applicants respectfully submit claims 57-59 stand now in an allowable condition.

Claim 57 has the novel concept of:

> satisfying a service model if an arrival model is satisfied by an initiator if a request arrives before a first time less than or equal to an ordinal number times an arrival interval, wherein the ordinal number signifies a position of the request among a group of requests; and
> wherein the service model is satisfied if the request is serviced before a second time less than or equal to a constant term plus the ordinal number times a service interval. (Office Action page 16)

Claim Rejections - 35 USC § 101

Claims 33-34, 37-39, and 47-56 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Independent claims 33 and 47, as amended, are directed to a method tied to maintaining QoS and/or thread tracking in the particular field of Integrated Circuits (ICs). Accordingly applicants request the withdraw of the 35 U.S.C. 101 for claims 33 and 47 and their respective dependent claims, claims 34, 37-39, and 48-56.

Claims 33 and 47 as amended state:

33. A method for satisfying a Quality of Service (QoS) contract with an initiator in an Integrated Circuit, comprising:

receiving a request from the initiator in the Integrated Circuit in a first time less than or equal to an ordinal number times an arrival interval to satisfy an arrival model, wherein the ordinal number signifies a position of the request among a group of requests;

returning the request from the initiator that has been serviced by a target to the initiator in a second time less than or equal to a constant term plus the ordinal number times a service interval to satisfy a service model; and

measuring the first and second time at a boundary between the initiator and an interconnect in the Integrated Circuit .

47. A method for tracking service for two or more threads in an Integrated Circuit, comprising:

maintaining a first allocation count for a first thread to track whether the first thread is being serviced by a target in the Integrated Circuit;

establishing an adjustable positive limit having a first value for the first allocation count that establishes an initial maximum amount the first allocation count may go up to; and

raising the adjustable positive limit for the first allocation count to a second value when the first value for the first allocation count has been reached and the first thread has yet to have a request fulfilled from the target during a regular interval of time . . .

Claim Rejections - 35 USC § 112

Claims 33-39 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The office action states "Claim 33 recites the limitation "the request that has been serviced" in line 6. There is insufficient antecedent basis for this limitation in the claim." Applicants disagree as there was only one mention of a request but to mute this point, applicant assert claim 33 as recited above overcomes the 35 U.S.C. 112, second paragraph rejection.

Claim Rejections - 35 USC § 103

Claims 33, 34, and 37-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over prior art of record Yang in view of Lindeman.

Applicants assert the following.

Yang merely discloses a memory control unit with various read accesses and write accesses for external memory chips in computer input/output operations.

Yang is silent regarding receiving a request from an initiator in a first time less than or equal to a request position number times an arrival interval which is a time period for arrival of the request. Therefore, Yang does not disclose or suggest receiving a request from an initiator in a first time less than or equal to a request position number times an arrival interval which is a time period for arrival of the request. The request needs to arrive within the arrival interval in order to satisfy the arrival model. Yang does not establish the deadlines for each request in the group of requests from a specific source, such as a particular thread of an initiator, based upon the ordinal position of that particular request within that group of requests from that specific source. Thus, where in the group of request that particular request is positioned is factored into the calculation by the QoS algorithm to determine a deadline by which that particular request needs to be issued/serviced. Discussions regarding this concept of setting each request's deadline in the QOS contract based on the ordinal position of that particular request within that group of requests from that specific source are not present in Yang.

Claim 33 states

> receiving a request from an initiator in a first time less than or equal to an ordinal number times an arrival interval to satisfy an arrival model, wherein the ordinal number signifies a position of the request among a group of requests;
> returning the request that has been serviced to the initiator in a second time less than or equal to a constant term plus the ordinal number times a service interval to satisfy a service model.

The office action ignores the feature of establishing the deadlines for each request in the group of requests from a specific source based upon the ordinal position

of that particular request within that group. Yang fails to suggest the benefit of this limitation. For example, the patent application gives the following example benefit "The fourth and last request does not need to be serviced until 4s according to the model, and since the target 12 has serviced the first three requests 42a-c early, the target 12 is free to service other requests as long as the final request 42d is serviced before a time 4s. As can be seen in Figure 5B, the [entire] group 71 has been serviced according to the model." [Paragraph 0031] Thus, the system is able to satisfy QoS contracts for each request of each thread relative to all of the requests in that thread plus the system is able to satisfy the QoS contracts for each entire thread relative to the other threads being served in the system.

Yang is silent regarding returning the request that has been serviced to the initiator in a second time less than or equal to a constant term plus the request position number times a service interval to satisfy a service model. Therefore, Yang does not disclose or suggest returning the request that has been serviced to the initiator in a second time less than or equal to a constant term plus the request position number times a service interval to satisfy a service model.

Yang is silent regarding measuring the first and second time at a boundary between the initiator and an interconnect. Therefore, Yang does not disclose or suggest measuring the first and second time at a boundary between the initiator and an interconnect because Yang merely discloses a memory control unit with various read accesses and write accesses for external memory chips in computer input/output operations. Yang does not measure the time period to satisfy a QoS contract associated with the requests at the boundary between the interconnect and target or initiator.

Yang is silent regarding a location of a QoS logic unit implementing an algorithm to ensure that the QoS contract for these requests and responses is placed at least at the boundary layer to ensure that the system fulfils these QoS contracts. Further, Zhang's teaching of fulfilling a contract also do not disclose this concept. Locating the logic unit configured to implement the QoS satisfying algorithm to measure the QoS time periods against the deadlines established for each request does have a direct technical effect of the method of satisfying a QoS. By being located at this boundary,

the logic unit can reference the actual arrival times verses the calculated deadline to ensure the QoS contract is satisfied and if not provide feedback to the interconnect.

Although not discussed in the office action, applicants assert that Lindeman does not make the deficiencies discussed above for Yang.

Therefore, references Yang and Lindeman separately or in combination do not disclose the limitations "receiving a request from an initiator in a first time less than or equal to an ordinal number times an arrival interval to satisfy an arrival model, wherein the ordinal number signifies a position of the request among a group of requests; returning the request that has been serviced to the initiator in a second time less than or equal to a constant term plus the ordinal number times a service interval to satisfy a service model; and measuring the first and second time at a boundary between the initiator and an interconnect" as recited in claim 33.

It is respectfully submitted that independent claim 33 and dependent claims 34, and 37-46 are not obvious in view of Yang and Linderman. Note, Zhang was also put into the reasoning sometimes for these claims even though the reject states it is merely based on Yang and Linderman but nonetheless Zhang and Zhang in combination with Yang and Linderman also do not make up for the deficiencies discussed for Yang above.

Claims 35-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yang, Lindeman and Zhang and further in view of prior art of record U.S. Patent Application Publication US 2002/0129173 Al by Weber ("Weber '02"). Weber is asserted as teaching a system on a chip. Applicants reserve the right to have Weber removed from consideration as prior art under 103 in the future. Claims 35-36 are patentable under 35 U.S.C. 103(a) over Yang, Lindeman, Zhang, and Weber for these reasons discussed for independent claim 33 above. Claims 35-36 dependent on independent claim 33.

Claims 47-50 and 53-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,440,752 to Lentz et al. ("Lentz") in view of U.S. Patent 4,393,470 to Miard ("Miard"). Claim 47 has been amended to include the novel concept of claim 62 and roughly mirrors independent claim 57.

Claim 47, as amended, has the novel concept of:

> satisfying a service model if an arrival model is satisfied by an initiator if a request arrives before a first time less than or equal to an ordinal number times an arrival interval, wherein the ordinal number signifies a position of the request among a group of requests; and
>
> wherein the service model is satisfied if the request is serviced before a second time less than or equal to a constant term plus the ordinal number times a service interval

which the office action acknowledges is novel in view of the prior art. Accordingly, Claims 47-50 and 53-55 are patentable over Lentz and Miard under 35 U.S.C. 103(a). The arguments for independent claim 33 express reasons that are similar to why this prior art combination does not render claim 47 obvious under 35 U.S.C. 103(a).

Claims 51 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lentz and Miard in view of U.S. Patent Application Publication 2002/0038397 Al by Singh et al. ("Singh").

Claims 51 and 52 depend upon independent claim 47 as amended. Accordingly, Claims 51 and 52 are patentable over Lentz, Singh, and Miard under 35 U.S.C. 103(a).

Claims 56-58 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lentz and Miard in view Weber '02.

Claims 56 depends upon independent claim 47 as amended. Accordingly, Claim 56 is patentable over Lentz, Weber, and Miard under 35 U.S.C. 103(a). The objected to limitations in claim 62 were written into independent claim 57. Accordingly, Claims 57, 58, and 60 are patentable over Lentz, Weber, and Miard under 35 U.S.C. 103(a).

Claim 59 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lentz, Miard, and Weber '02 in view of Singh. The objected to limitations in claim 62 were written into independent claim 57. Accordingly, dependent Claim 59 is patentable over Lentz, Weber, Singh, and Miard under 35 U.S.C. 103(a).

Claim 61 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lentz, Miard, and Weber '02 in view of Yang. Claim 61 has been canceled without prejudice.

Conclusion

It is respectfully submitted that in view of the amendments and remarks set forth herein, the rejections and objections have been overcome. An Information Disclosure Statement is also submitted with this amendment. Applicants reserve all rights with respect to the application of the doctrine equivalents. If there are any additional charges, please charge them to our Deposit Account No. 50-2191. Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

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